



PROSTHODONTIC REHABILITATION OF A PATIENT WITH IMPLANT RETAINED MANDIBULAR OVERDENTURE USING LOCATOR SYSTEM AND SEMI-PRECISION ATTACHMENT RETAINED MAXILLARY CAST PARTIAL DENTURE: A CASE REPORT

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Abstract-

A traditional treatment approach that has had greater results is the use of attachment to provide retention for detachable prostheses. It significantly enhances patient comfort, aesthetics, functionality, and satisfaction, particularly in patients with long-term edentulism when implants and fixed partial dentures (FPD) are not recommended and cast partial dentures are barely acceptable. Many people regard an implant-retained complete lower denture as the industry benchmark for the oral rehabilitation of the edentulous mandible. It is a desirable therapeutic option due to its relative simplicity, minimal invasiveness, predictability, effectiveness, and cost. Magnets, studs, and bars are the most commonly used techniques for securing overdentures to implants. The Locator® system, a relatively new kind of stud attachment, was used to treat a patient in this case report. It discusses the use of an extracoronal semi-precision attachment to improve the retention of detachable prostheses and reconstruct the edentulous mandible and outlines a chairside method for retaining a full lower denture using the Locator® device.

Keywords- Implant Retained Mandibular Overdenture, Locator®, Extracoronal semi-precision attachment, Preci-Sagix, Cast partial dentures

Introduction-

Situations involving many lost teeth always demand significant consideration and rigorous treatment planning. When there is a unilateral or bilateral distal extension situation, it is more difficult.¹ Restoring function, protecting oral tissues, and maintaining aesthetics should be our top priorities when replacing lost teeth.² Semi-precision attachments are laboratory-made or custommade types. The components usually originate as prefabricated or manufactured patterns (made of plastic nylon or wax) or hand waxed. For Kennedy's Class III and Class IV tooth-supported prostheses, rigid attachments can be used; resilient attachments are suggested for tissue-supported long-span Class IV and distal extension Class I or II instances.^{3,4}

While complete edentulism has a significant influence on a person's quality of life, complete dentures may help by rehabilitating the patient's expression functionally and aesthetically. However, because of advanced alveolar bone resorption, the denture is commonly unstable, especially in the mandible, impeding the full completion of the therapy.^{5,6,7} So, to enhance the denture stability dental implants may be added to this therapeutic strategy to considerably increase treatment success rates. The single mechanism that can firmly connect implants and prostheses, the attachment system, is the only one that can achieve this result. As a result, attachments are the foundation of this therapeutic approach and may reveal whether it is effective or not.⁸⁻¹²

This case report discusses the rehabilitation of Maxillary Kennedy's Class 1 distal extension with extracoronal semi-precision attachment (*Preci-Sagix*) retained cast partial denture and implant retained mandibular overdenture using *Locator*® attachment.

CASE REPORT-

A 59 years old male patient reported with a chief complaint of difficulty in mastication, speech, and unaesthetic appearance to the Department of Prosthodontics and Crown & Bridge, Career Postgraduate Institute of Dental Science & Hospital, Lucknow. According to the patient's previous medical and dental history, the patient met with an accident three years ago and lost all his mandibular and a few maxillary posterior teeth. He was treated with a mandibular complete denture and a maxillary removable partial denture. The patient was not satisfied with the previous denture due to its poor retention, stability, and aesthetics.

Intra-oral examination revealed a completely edentulous mandibular arch and missing teeth 16, 26, 27 with root stumps 14, 15, 16. Grossly decayed teeth were 18, 13, 23, 24, 25 (*Fig. 1*)



Fig. 1 Pre-operative intraoral view

Treatment-

Following treatment steps were followed-

1. Patient education and motivation.
2. Extractions irt 18, 16, 15, 14
3. Root Canal Treatment irt 13, 12, 11, 21, 22, 23, 24, 25
4. Diagnostic impressions & Diagnostic casts
5. Interim Prosthesis delivered
6. Implant placement irt B & D positions.
7. Tooth preparation and final impression
8. Final impression
9. Facebow record, transfer, and jaw relation
10. Coping trial & try-in
11. Pick up impression for the attachment retained CPD.
12. Cementation of maxillary FPD
13. Locator attachment placement and nylon insert pick up
14. Final prosthesis delivered
15. Recall

Diagnostic impressions were made with alginate and diagnostic mounting was done to evaluate the interarch space. Inter arch space available was 13mm. After extractions and RCT of indicated teeth an interim prosthesis was fabricated for the patient till the time osseointegration of implants take place (Fig.2).



Fig. 2 Interim prosthesis

After CBCT and OPG evaluation (Fig. 3), two MIS implants of size 3.75x11 mm were placed in B & D position in the anterior mandible and left for 3 months for osseointegration (Fig.4)



Fig. 3 CBCT & OPG

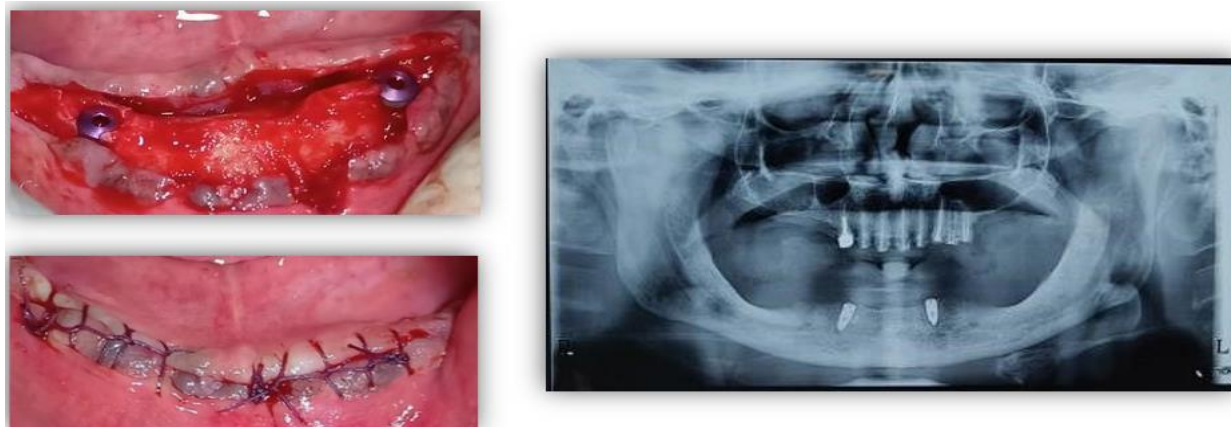


Fig. 4 Implant placement & Post-op OPG

After 3 months, tooth preparations were refined, and final impressions of maxillary and mandibular arches were made with polyvinyl siloxane impression material (*Fig. 5*) & master casts were poured (*Fig. 6*). Facebow transfer and jaw record were done for the fabrication of copings with PreciSagix attachment irt 13 to 24. The coping trail and the unglazed trail were done (*Fig. 7*) to check the marginal fit of the prosthesis and a pick-up impression of the unglazed bridge was done for the fabrication of cast partial denture (*Fig. 8*).

Facebow transfer and jaw record were made again (*Fig. 9*) and teeth arrangement was done. Tryin was done in the patient's mouth and checked for bilateral balanced occlusion, phonetics, and esthetics (*Fig. 10*), and the final prosthesis was fabricated in heat cure denture base resin with PFM bridge irt 13-11 & 21-25 (*Fig. 11*).

Chairside steps for pick-up of Locator attachment (*Fig 12*)-

1. MIS LOCKiT system was selected containing LOCKiT abutment, silicon ring, metal housing, and plastic cap.
2. Tissue height was measured and a 2mm height locator abutment was selected.
3. Torque wrench driver was used to screw the abutment over the implant with a force of 30Ncm.
4. Silicon rings were placed around the abutment to prevent excess flow of acrylic and metal housing with black male processing caps placed over the abutment.
5. Relief holes were created in the denture and filled with self-cure acrylic resin and placed over the abutment and the patient was asked to bite till the resin was completely cured.
6. Remove the black cap with the LOCKiT core tool and blue male inserts are placed within the housing with the seating tool.

Final prosthesis was delivered to the patient after verifying the proper adaptation of nylon inserts with attachments and occlusion (*Fig. 13*).

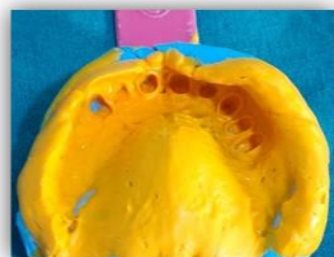


Fig. 5 Final Impressions



Fig. 6 Master casts



Fig. 7 Coping trial & Bisque trial



Fig. 8 Pick-up impression

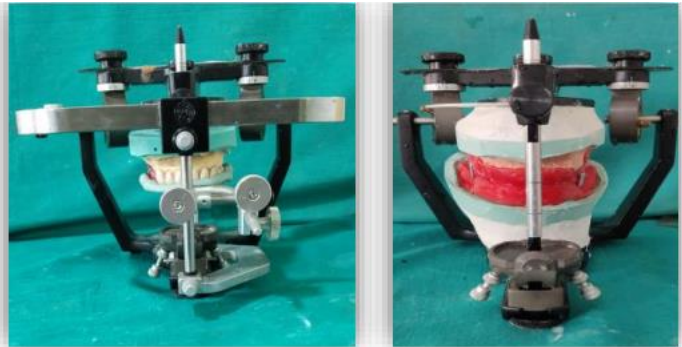


Fig. 9 Facebow transfer & Jaw record

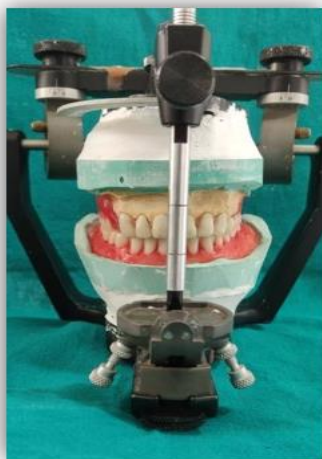


Fig. 10 Teeth arrangement & Try-in



Fig. 11 Final Prosthesis

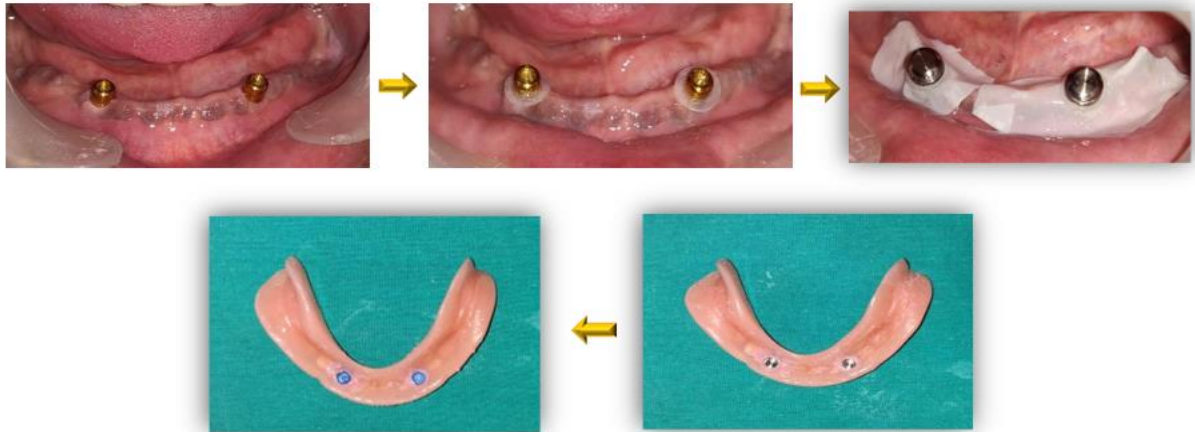


Fig. 12 Locator attachment placement



Fig. 13 Final prosthesis



Post-insertion instructions were given to the patient and the patient was kept on regular followups. The patient was highly satisfied with the treatment outcome.

Discussion-

Semi-precision attachments are made by the direct casting of plastic wax or refractory design. Precision attachments were developed in response to the goal to achieve a balance between functional stability and visual appeal in partial dentures. Typically used for long-span edentulous arches, distal extension bases, and nonparallel abutments. It gives the cast partial denture the outstanding features of better retention, increased comfort, superior aesthetics, and fewer postoperative modifications.^{1,2,13} In this case, the Preci-Sagix was made up of extracoronal male and female parts. The sagix size was 2.2 mm. Three retention levels are offered for female components: Red: greater retention, white: decreased retention, and yellow: normal retention.

The problems of using intracoronal attachments—excessive tooth reduction, impaired embrasures, and poor esthetics—are all resolved by semi-precision attachments. Each attachment has a shelf life specified by the makers with a robust counterpart. The use-related wear and tear on the plastic resilient cap need replacement when its retentive ability is diminished.¹³

The overdenture prosthesis can be supported by implants, which can also give predictable retention and stability. A mandibular overdenture can be kept in place with the help of implants and retentive anchors in an affordable way.¹⁴ This process enables the fabrication of lower overdentures using Locator Attachments, which, according to *Sadig*,¹⁵ have the maximum retention and stability followed by ball attachment, and then ultimately magnets. *Cordaro et al.*¹⁶ observed that doctors discovered superior sanitary conditions and soft-tissue health in the locator group. The locator system, as compared to the ball and bar attachments, had better clinical outcomes, according to *Cakarer et al.*¹⁷ *El-Sheikh et al.*'s¹⁸ clinical trial offered more evidence in favor of this. They reached to the conclusion that in situations of mandibular atrophy, the use of two narrow bone level implants with locator attachments looks predictable and can support an overdenture sufficiently.

The patient must follow the prescribed cleanliness and follow-up schedule for overdentures. It may be necessary to relines the lower denture due to posterior bone loss. Male cap replacement is a straightforward chairside surgery that may be necessary if retention is lost.

Conclusion-

This case report provides insight into an easier method of placement of locator attachment (Chairside method) which is simple, economical, and non-invasive. Complicated cases like unilateral or bilateral distal extension cases can be effectively treated with attachment-retained cast partial dentures which provide satisfactory retention, stability, and support.

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